CHARLES UNIVERSITY
Faculty of mathematics
and physics

Using Constrained Horn Clauses for Hierarchical Planning

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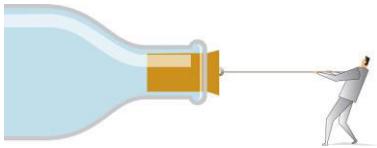
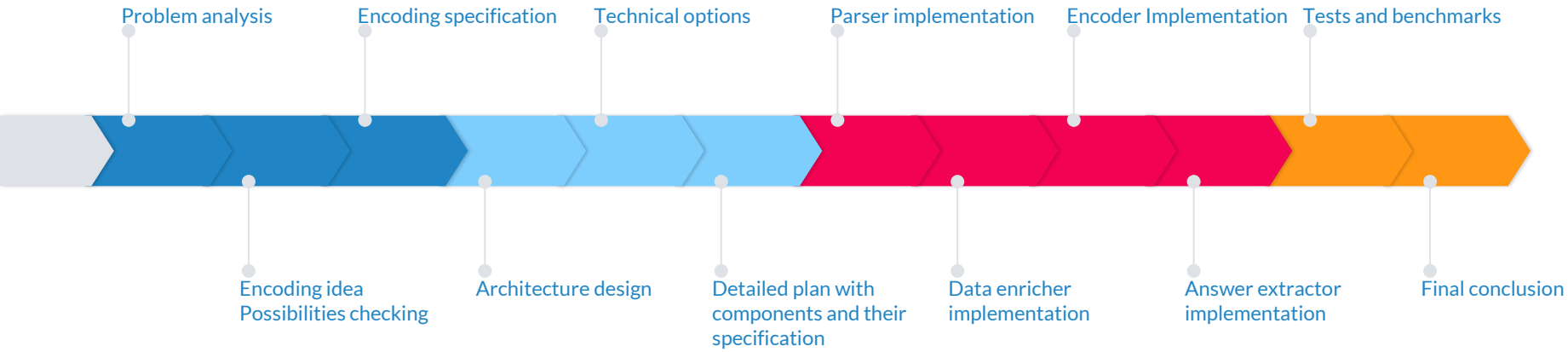
Study branch: Programming & software systems

Context

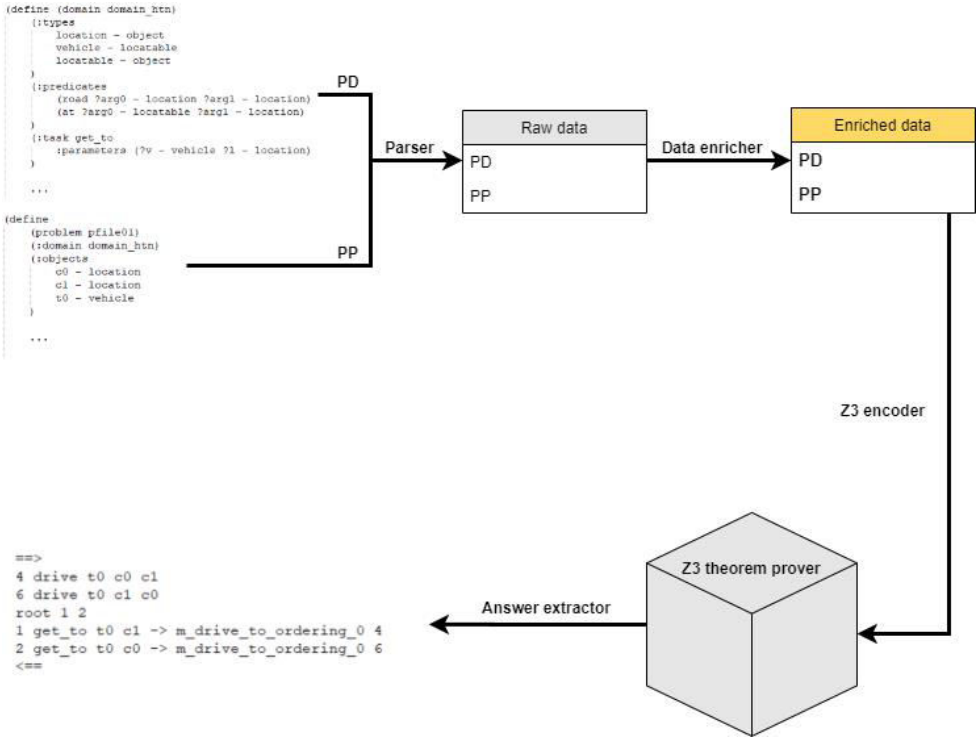
Analysis	Finding	Solution
The most popular approach for HTN problems is to use incremental SAT.	This approach includes numerous alterations during the calculation phase. Can this be enhanced?	Propose an encoding of totally-ordered HP problems into CHC, use off-the-shelf CHC solver to solve the compiled problem and extract the plan from the CHC solution



Milestones


Problem analysis
Encoding idea
Possibilities checking
Encoding specification
Architecture design
Technical options
Detailed plan with components and their specification
Parser implementation
Data enricher implementation
Encoder Implementation
Answer extractor implementation
Tests and benchmarks
Final conclusion

Solution plan & main components



Comparism

Solver	rover01	satellite01	um-translog01	transport01
Lilotane	0.11s	0.06s	0.28s	0.06s
HyperTensioN	0.32s	0.03s	0.37s	0.12s
Our	4.8s	1.5s	50s	1.3s

table with execution times of basic dataset

Solver	Prob_2	Prob_3	Prob_4	Prob_5	Prob_6
Lilotane	0.07s	0.09s	0.14s	0.2s	0.3s
HyperTensioN	0.01s	0.02s	0.05s	0.13s	0.9s
Our	1.3s	6.1s	17s	69s	350s

table with execution times of level dataset

Q&A